European Coatings Show
Joncryl® FLX water-based binders for flexible packaging inks
29th of March 2011
BASF Nederland B.V. - Jan van Delft
Joncryl® FLX Line
Market Drivers

Compliance / Safety
- Food contact
- Safety and health protection
- Explosion safety
- Carbon Footprint
- Sustainable raw materials
- Solvent emission control
- Lower energy consumption

Cost / Efficiency
- Material saving
- Reduced coating weights
- Capital investment saving
- Printing speed

Performance / Effect
- Resistance properties
- Adhesion on flexible films
- Lamination bond strength
- Color strength
- Print quality
- Resolubility
- Opacity
**Eco-Efficiency Analysis**

**Solvent-based vs Water-based printing**

**User Benefit:**
Printing 1000m² of LDPE Film
40% image coverage, 4-station press, Europe.

**Conclusion:** Water-based is the Eco-efficient way of printing
Eco-Efficiency Analysis
Solvent-based vs Water-based printing

User Benefit:
Printing 1000m² of LDPE Film
40% image coverage,
4-station press,
Europe.

Conclusion: Water-based is the Eco-efficient way of printing
Flexible Packaging Application Areas

Surface print and lamination inks

Surface print PE
- Low-/medium-duty
- Heavy-duty

Surface Print OPP

Lamination

Reverse Print OPP
- Low-duty lamination
- Medium-duty lamination
- Heavy-duty lamination

Reverse Print OPP, PET

Reverse Print Nylon, PET
Joncryl® FLX 5000 & Joncryl® FLX 5002
Self-crosslinking acrylic emulsion for surface print

- Suitable for surface print PE, OPP and bio-films
- Excellent resolubility
- Very good print behavior (flexo)
- Good end resistance of printed material
- Very successful in the medium-duty area
  - Carrier bags
  - Bread bags
Suitable for surface print PE for medium- & heavy-duty applications

Good printability and resolubility

Very good resistance properties
  - Scratch resistance
  - Wrinkle resistance (dry and wet)
  - Heat seal resistance
  - Blocking resistance
  - Wet rub resistance (satra)
  - Alkali resistance

Deep freeze packaging, out door packaging
Lamination market is currently covered for 99% by solvent-based ink.

### Typical solvent-based lamination inks

<table>
<thead>
<tr>
<th>Ink Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>NC / Thermoplastic PU ink</td>
<td>General purpose ink, for low-, medium-duty lamination</td>
</tr>
<tr>
<td>PVB / Adhesion promoter ink</td>
<td>Medium-duty lamination ink, flexo &amp; gravure</td>
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<tr>
<td>PVC ink</td>
<td>Heavy-duty lamination ink, gravure only</td>
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<td>More universal ink, for medium-duty lamination</td>
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### First generation water-based lamination inks

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<td></td>
<td>+ Good lamination bond strength (OPP, PET)</td>
</tr>
<tr>
<td></td>
<td>- Poor compatibility with various pigment concentrates</td>
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<tr>
<td></td>
<td>- Moderate resolubility / printability (substrate wetting)</td>
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<td>- High price</td>
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Lamination Ink Market
Current Situation

- Lamination market is currently covered for 99% by solvent-based ink

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Development of Joncryl FLX5040 for Lamination Inks for OPP and PET

Joncryl FLX 5030 for OPP lamination
BASF Nederland B.V. - Hall 7A - 411

Joncryl® FLX 5040
Self-crosslinking acrylic emulsion for lamination inks

- Excellent resolubility

- Reverse print PET and OPP lamination
  - Good lamination bond strength
  - Good blocking resistance
  - High heat seal bond
  - Pigment concentrates versatility
    - resin free and resin based concentrates

Lamination Bond strength

Polyester
Color
White
Adhesive
LDPE
### Joncryl® FLX 5040

**Lamination Bond strength**

<table>
<thead>
<tr>
<th>Ink</th>
<th>OPP//OPP - Heat seal</th>
<th>OPP//OPP + Heat seal</th>
<th>PET//PE - Heat seal</th>
<th>PET//PE + Heat seal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>2.5</td>
<td>2.5</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>White</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Color+White</td>
<td>2.5</td>
<td>2.0</td>
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Lamination bond strength in N/15mm  
Adhesive: 2K PUR solvent free, 2.2 gsm dry  
Heat seal conditions: 140°C/400N/1sec.

→ **Lamination results meet market requirements (2N/15mm)**
## Joncryl® FLX line

### Property overview

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<tr>
<th>Surface print</th>
<th>Resolubility</th>
<th>Resistance</th>
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<tr>
<td>Joncryl® FLX 5000</td>
<td>++</td>
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</tr>
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<td>Joncryl® FLX 5002</td>
<td>+++</td>
<td>+/-</td>
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⇒ Product and formulation details in the Joncryl FLX® brochure
Joncryl® FLX product line

Conclusions

- Proven water-based technology platform for film printing
- Excellent resolubility and printability
- For surface print and for reverse print lamination
- The cost-effective and eco-efficient alternative to solvent-based systems
Thanks for your attention
Any questions?

You’re very welcome to visit us at the BASF stand:

Hall 7A - 411

jan.van-delft@basf.com or +31 6 1092 2648